

WHAT IS CLAIMED IS:

1. A portable radio communication apparatus comprising a housing,

5 wherein at least one part of said housing is formed as a housing electrical conductor portion by an electrically conductive material, and

wherein said housing electrical conductor portion is connected with a radio communication circuit of said portable radio communication apparatus so as to operate as at least one part of an antenna of said radio communication circuit.

10 2. The apparatus as claimed in claim 1,
wherein said antenna is an unbalanced type antenna.

3. The apparatus as claimed in claim 1,
wherein said portable radio communication apparatus is a straight type portable radio communication apparatus.

15 4. The apparatus as claimed in claim 1,
wherein said portable radio communication apparatus is a slide type portable radio communication apparatus in which an upper housing and a lower housing are slidable through a sliding mechanism, and

20 wherein at least one part of at least one of said upper housing and said lower housing is formed as a housing electrical conductor portion by an electrically conductive material.

5. The apparatus as claimed in claim 1,
25 wherein said portable radio communication apparatus is a folding portable radio communication apparatus in which an upper housing and a lower housing are foldable through a hinge portion, and
wherein at least one part of at least one of said upper housing

and said lower housing is formed as a housing electrical conductor portion by an electrically conductive material.

6. The apparatus as claimed in claim 1,
wherein said housing electrical conductor portion is made by
5 forming an electrical conductor layer on a dielectric housing which is at least one part of said housing.

7. The apparatus as claimed in claim 6,
wherein said electrical conductor layer is made by forming an electrical conductor pattern on said dielectric housing.

10 8. The apparatus as claimed in claim 6,
wherein said electrical conductor layer includes electrical conductor patterns different from each other on both surfaces of said dielectric housing, respectively, so that said antenna operates in a plurality of frequency bands.

15 9. The apparatus as claimed in claim 6,
wherein said electrical conductor layer includes a plurality of electrical conductor portions having electric lengths different from each other, respectively, so that said antenna operates in a plurality of frequency bands.

20 10. The apparatus as claimed in claim 6, further comprising one of a slot and a slit which are formed in said electrical conductor layer.

11. The apparatus as claimed in claim 4,
wherein said upper housing includes an upper first housing portion and an upper second housing portion, and
25 wherein at least one of said upper first housing portion and said upper second housing portion is formed as a housing electrical conductor portion by an electrically conductive material so that said

housing electrical conductor portion operates as at least one part of the antenna of the portable radio communication apparatus.

12. The apparatus as claimed in claim 4,
wherein said lower housing includes a lower first housing portion
5 and a lower second housing portion, and

wherein at least one of said lower first housing portion and said lower second housing portion is formed as a housing electrical conductor portion by an electrically conductive material so that said housing electrical conductor portion operates as at least one part of the antenna
10 of the portable radio communication apparatus.

13. The apparatus as claimed in claim 5,
wherein at least one part of said hinge portion is formed as a hinge electrical conductor portion by an electrically conductive material,
and

15 wherein said hinge electrical conductor portion is connected with the radio communication circuit of said portable radio communication apparatus so as to operate as at least one part of the antenna of said radio communication circuit.

14. The apparatus as claimed in claim 5,
20 wherein at least one part of said hinge portion is formed as a hinge electrical conductor portion by an electrically conductive material so that said hinge electrical conductor portion operates as a parasitic element of the antenna of said radio communication circuit.

15. The apparatus as claimed in claim 13,
25 wherein said hinge portion is made to be rotatable in at least biaxial directions.

16. The apparatus as claimed in claim 13, further comprising

an electrically insulating layer formed on said hinge portion.

17. The apparatus as claimed in claim 1, further comprising:

a plurality of reactance elements having a plurality of reactance values different from each other, respectively; and

5 a switching device for selectively switching over said plurality of reactance elements so as to connect selected one of said reactance elements with said housing electrical conductor portion.

18. The apparatus as claimed in claim 13, further comprising:

10 a plurality of reactance elements having a plurality of reactance values different from each other, respectively; and

a switching device for selectively switching over said plurality of reactance elements so as to connect selected one of said reactance elements with said housing electrical conductor portion through said hinge electrical conductor portion.

15 19. The apparatus as claimed in claim 17,

wherein said switching device selectively switches over said plurality of reactance elements in accordance with whether said portable radio communication apparatus is in either one of an open state and a closed state thereof.

20 20. The apparatus as claimed in claim 17,

wherein said switching device selectively switches over said plurality of reactance elements in accordance with a plurality of operating frequency bands of said portable radio communication apparatus.

25 21. The apparatus as claimed in claim 17,

wherein said switching device selectively switches over said plurality of reactance elements in accordance with either one of

transmission and receiving of said portable radio communication apparatus.

22. The apparatus as claimed in claim 1,
wherein said housing electrical conductor portion is made of one
5 of a dielectric material and a magnetic material, and

wherein said housing electrical conductor portion is connected
with said radio communication circuit through an electrical insulator
having a predetermined capacitance so that a radio signal from said
radio communication circuit is fed through the capacitance of the
10 electrical insulator to said housing electrical conductor portion.

23. The apparatus as claimed in claim 1, further comprising a
thin-film-shaped electrically insulating sheet formed on the upper
housing having said housing electrical conductor portion, said
thin-film-shaped electrically insulating sheet being made of one of a
15 dielectric material and a magnetic material.